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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/652,097	08/31/2000	Mark Richard Shaw	13DV13495	2850

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JOHN S. BEULICK
C/O ARMSTRONG TEASDALE LLP
ONE METROPOLITAN SQUARE
SUITE 2600
ST. LOUIS, MO 63102-2740

EXAMINER	
STEVENS, THOMAS H	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 05/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/652,097	SHAW ET AL.	
	Examiner	Art Unit	
	Thomas H. Stevens	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-7 and 9-12* is/are pending in the application.

4a) Of the above claim(s) *4,8 and 13-19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-7 and 9-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-19 were previously examined.

2. Claims 4,5,8,13-19 were canceled.

3. Claims 1-3,6-7, 9-12 were examined.

Section I: Response to Applicants' Arguments

35 USC § 112 1st

4. Applicants are thanked for addressing this issue. Restated, the specification does not provide examples or computations of how to create a stiffness multiplier for a shrouded bellow. Furthermore, applicants' state that each shrouded bellow configuration can be modeled analytically to determine a unique stiffness multiplier for that specific shrouded below; but fails to teach what analytical tools (i.e., computer software, pencil/paper) are required for this process. Summarily, the specification provides no arithmetic proof of this process, which in turn, borderlines theoretical concepts. Rejection stands.

112 2nd

5. Based on applicants' explanation, claim 6 rejection is withdrawn.

103(a)

6. Applicants are thanked for addressing this issue. Examiner will correct *prima facie* reasoning. However, examiner's prior art suggest the teaching of the invention in question with regard to stiffness multiplier. Applicants' disclose "stiffness component test data" that is equivalent, conceptually, to "empirical data" as taught by Rosemount. Applicants' state that Broman teaches non-shrouded bellows but applicants have not

provided proof of this alleged fact. Applicants are correct in stating Rosemount's lack of teaching modeling but applicants are reminded of the prima facie case reasoning; in this specific case Rosemount's equations coupled with Broman's computer model.

Applicants state Broman does not capture *"the affects of fiction (examiner assumes applicants meant "friction"), and/or other affects causes by outer shroud and the inner liner as recited in the pending claims"* (applicants answer, pg.6 2nd paragraph 7-9). Examiner didn't see, verbatim, "inner liner" in any of the claims. Moreover, applicants have admitted Broman teaching *"utilizes a mathematical formula based on engineering principles"* (pg. 5, lines 2-3), which would encompass the laws of physical science, relied upon in the analytical process. Rejection stands.

Section II: Non-Final Rejection (After RCE)

Claim Objection

7. Applicants' response to arguments states claim 4 is canceled but the status identifier, in the amended claim, reads as "original". Clarification is required.

Claim Rejections - 35 USC § 101

8. Claims 1-3,5-7, 9-12 are rejected under 35 U.S.C. 101 because the language of the claim raises a question as to whether the claim is directed merely to an abstract idea that is not tied to a technological art, environment or machine which would result in a practical application to form the basis of statutory subject matter under 35 U.S.C. 101. Based on the language, one can perform these functions with pencil and paper.

Furthermore, the specification fails to demonstrate, either through arithmetically or software equivalence, the process (e.g., a stiffness multiplier or naturally frequency), of these events which queries as to whether the claims are merely an abstract idea.

Claim Rejections - 35 USC § 103

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-3,6-7, 9-12 are rejected under 35 U.S.C. 103 (a) as unpatentable by Rosemount™ Inc. (Technical Data Sheet "Pressure Fundamentals and Transmitter Selection" 1998), in view of Broman et al. ("Modeling Flexible Bellows by Standard Beam Finite Elements" 1999).

Rosemount™ Inc. teaches the fundamentals of pressure measurement as they relate to industry, and factors that should be considered in selecting a pressure transmitter inside mechanical elements (pg. 2, introduction; and pg. 5, bellow elements). Although, Rosemount teaches the applicable physics behind theses devices in relation to pressure flow, it doesn't teach applying these properties to modeling/simulation.

Broman et al. teaches modeling flexible bellows by standard beam finite elements by way of the *I-DEAS Master Series 6* modeling software (pg. 9, 4th paragraph, line 3).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to use Broman et al. to modify Rosemount™ Inc. since it would have been advantageous to model the whole exhaust system, which encompasses, axial bending and torsion characteristics of the bellows itself, as well as the interaction with the rest of the system (Broman: pg. 9, 4th paragraph, lines 3-6).

Claim 1: A method for predicting natural frequency (Rosemount: pg. 5, left column, 2nd paragraph & equation) responses said method comprising the steps of: providing at least one tube sub-system including a plurality of shrouded bellows components; determining a stiffness multiplier within each of the shrouded bellows components from input values; using the determined stiffness multiplier in a model (Broman: title and pg. 18, lines 10-11) that applies a standard geometry element and flexibility factor based upon the stiffness multiplier to predict a natural frequency response, and determining location for duct supports.

Claim 2: A method in accordance with Claim 1 further comprises the step of inputting dynamic system operating inputs into the model (Broman: pgs 4-5, notations; and Rosemount: pg. 4, right column, 1st paragraph and 2nd paragraph, lines 9-12).

Claim 3: A method in accordance with Claim 2 wherein said step of inputting dynamic system (Broman: pgs 4-5, notations; and Rosemount: pg. 4, right column, 1st paragraph and 2nd paragraph, lines 9-12) operating inputs further comprises the step of inputting at least an operating pressure and vibratory environment into the model (Broman: pg. 24, paragraphs 2 and 3).

Claim 6: A method in accordance with Claim 3 (Broman: pgs 4-5, notations; and Rosemount: pg. 4, right column, 1st paragraph and 2nd paragraph, lines 9-12) further comprising the step of determining system stiffness as a function of the stiffness multiplier (Rosemount: pg. 5, natural frequency equation; and Broman: pg 13, section 3.3 Axial Vibrations).

Claim 7: A modeling system for determining natural frequency response of shrouded bellows components, said system comprising a processor configured to determine a stiffness multiplier from input values (Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure; and Broman: pg 13, section 3.3 Axial Vibrations).

Claim 9: A modeling system in accordance with Claim 8 (Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations) wherein the input values include at least one of shrouded bellows geometry inputs and dynamic operating condition inputs (Broman: pg. 31-35, section 4.7.2, Specimen from Ting-Xin et al.).

Claim 10: A modeling system in accordance with Claim 8 (Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations) wherein the bellows geometry inputs include at least one of a tube (Bronman: pg. 18, 2nd paragraph and figure 3.6) sub-system diameter and a bellows pitch.

Claim 11: A modeling system in accordance with Claim 8 (Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations) wherein the dynamic operating condition inputs include at least an operating pressure (Broman: pg.26, section 4.7.1, Geometry and material properties (*E*)).

Claim 12: A modeling system in accordance with Claim 8 (Rosemount: pg. 5, natural frequency equation, pg. 24, section 4.6 Summary of Modeling Procedure, pg. 31 2nd paragraph; and Broman: pg 13, section 3.3 Axial Vibrations) wherein the stiffness

multiplier is adjustable such that a dynamic stiffness of the shrouded bellows is selectively variable.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Tom Stevens whose telephone number is 571-272-3715, Monday-Friday (8:00 am- 4:30 pm) or contact Supervisor Mr. Kevin Teska at (571) 272-3716. Fax number is 571-273-3715.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

May 2, 2005

THS